

CLAIMS

1. A communication apparatus for executing a wired communication using a plurality of sub carriers, comprising:

a transmission signal generator for generating a transmission signal;

a transmission signal controller for controlling a transmission power of the transmission signal generated by the transmission signal generator based on a radiation power in a transmission line in correspondence with a frequency of the sub carrier; and

a transmitter for transmitting the transmission signal the transmission power of which is controlled by the transmission signal controller via the transmission line.

2. The communication apparatus according to claim 1, wherein the transmission signal controller reduces the transmission power of the sub carrier of the frequency in which the radiation power exceeds a predetermined value.

3. The communication apparatus according to claim 2, wherein the transmission signal controller nullifies the transmission power of the sub carrier of the frequency

in which the radiation power exceeds the predetermined value.

4. The communication apparatus according to claim 2, wherein the transmission signal controller reduces the transmission power of the sub carrier of the frequency in which the radiation power exceeds the predetermined value until the radiation power becomes equal to or lower than the predetermined value.

5. The communication apparatus according to claim 2, wherein the transmission signal controller increases the transmission power of the sub carrier of the frequency in which the radiation power is equal to or lower than the predetermined value.

6. The communication apparatus according to claim 2, wherein the transmission signal controller intermittently changes the transmission power of the sub carrier of the frequency in which the radiation power exceeds the predetermined value.

7. The communication apparatus according to claim 1, wherein the transmission signal controller selects a modulation system of the sub carrier based on a indicating

the radiation power from the transmission line.

8. The communication apparatus according to claim 7, wherein the transmission signal controller changes the modulation system of the sub carrier of the frequency in which the radiation power exceeds the predetermined value to a modulation system having a relatively low communication rate.

9. The communication apparatus according to claim 1, wherein the transmission line utilizes a pair of lines, and the transmission signal generator generates the transmission signals transmitted to the pair of lines for each sub carrier and each transmission line based on a transmission data and the radiation power.

10. The communication apparatus according to claim 9, wherein the transmission signal generator generates a differential component of the transmission signal based on the transmission data and generates a common component of the transmission signal based on the radiation power.

11. The communication apparatus according to claim 10, wherein the common component is generated such that the radiation power is reduced.

12. The communication apparatus according to claim 11, wherein the radiation power includes a radiation power component when a predetermined test signal is transmitted to the transmission line as the differential signal and a radiation power component when the predetermined test signal is transmitted to the transmission line as a common mode signal.

13. The communication apparatus according to claim 9, wherein the transmission signal controller includes a time-frequency transformer for converting a radiation power signal indicating the radiation power into a frequency component, a comparator for comparing respectives of the frequency component with a predetermined comparison value and outputting a comparison result, a coefficient generator for generating a predetermined coefficient in accordance with an output of the comparator, and a parallel to serial converter for converting the coefficient outputted from the coefficient generator in parallel into a series coefficient data; and

wherein the transmission signal generator includes a first data converter and a second data converter for outputting a first transmission original data for

providing the transmission signal transmitted to one of the pair of lines and outputting a second transmission original data for providing the transmission signal transmitted to other of the pair of lines by converting the transmission data based on the series coefficient data.

14. The communication apparatus according to claim 13, wherein the common component of the transmission signal based on respective of the first transmission original data and the second transmission original data is a signal for canceling the radiation power signal.

15. The communication apparatus according to claim 1, further comprising:

a radiation power detector for directly detecting the radiation power.

16. The communication apparatus according to claim 1, wherein the wired transmission utilizes a pair of lines, further comprising:

a radiation power detector for indirectly detecting a signal of the radiation power by utilizing signals transmitted through the pair of lines:

17. The communication apparatus according to claim 16, wherein the radiation power detector detects an unbalance component of the signals transmitted through the pair of lines.

18. The communication apparatus according to claim 15, further comprising:

a radiation power transmitter for transmitting the radiation power signal indicating the radiation power detected by the radiation power detector to other communication apparatus.

19. The communication apparatus according to claim 15, further comprising:

a power control signal transmitter for transmitting a power control signal calculated based on the detected radiation power for controlling the transmission power of the sub carrier to other communication apparatus.

20. The communication apparatus according to claim 1, further comprising:

a radiation power receiver for receiving a radiation power signal indicating the radiation power from outside.

21. The communication apparatus according to claim 1, wherein the transmission signal controller intermittently makes the transmission powers of all of the sub carriers constant and utilizes the radiation power signal at that occasion for controlling the transmission signal.

22. The communication apparatus according to claim 1, wherein the radiation power signal indicating the radiation power is acquired only once in starting communication.

23. The communication apparatus according to claim 1, wherein the radiation power signal indicating the radiation power is acquired periodically.

24. The communication apparatus according to claim 1, wherein the transmission line is a power line.

25. The communication apparatus according to claim 1, wherein the wired transmission is a transmission of an OFDM system.

26. The communication apparatus according to claim 25, wherein the wired transmission is the transmission of

the OFDM system using a wavelet transformation.

27. A communication system comprising a plurality of communication apparatus connected via a wired transmission line, wherein one communication apparatus out of the plurality of communication apparatus is the communication apparatus according to claim 18 for transmitting the detected radiation power signal indicating the detected radiation power to all of remaining communication apparatus out of the plurality of communication apparatus; and

wherein the remaining communication apparatus are the communication apparatus according to claim 20 for controlling the transmission power of the sub carrier based on the radiation power signal received from the one communication apparatus.

28. A communication system comprising a plurality of communication apparatus connected via a wired transmission line, wherein one communication apparatus out of the plurality of communication apparatus is the communication apparatus according to claim 19 for transmitting the power control signal to all of remaining communication apparatus out of the plurality of communication apparatus; and

wherein the remaining communication apparatus control the transmission power of the sub carrier based on the transmission power control signal received from the one communication apparatus.

29. A communication method for executing a wired transmission by using a plurality of sub carriers, comprising:

generating a transmission signal;

controlling a transmission power of the generated transmission signal based on a radiation power in a transmission line in correspondence with a frequency of the sub carrier; and

transmitting a transmission signal the transmission power of which is controlled via the transmission line.